# Aviation Automation

## January 2018

## House Select Committee on Strategic Transportation Planning and Long Term Funding Solutions

NC STATE UNIVERSITY

The FAA's Center of Excellence for UAS Research

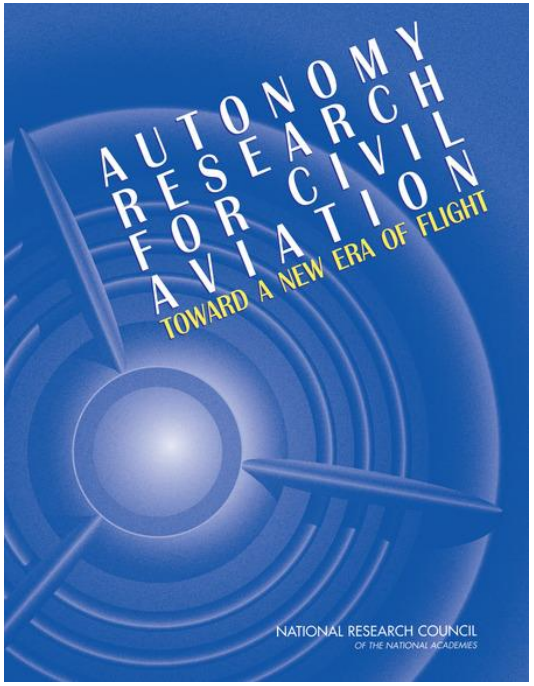
ASSURE

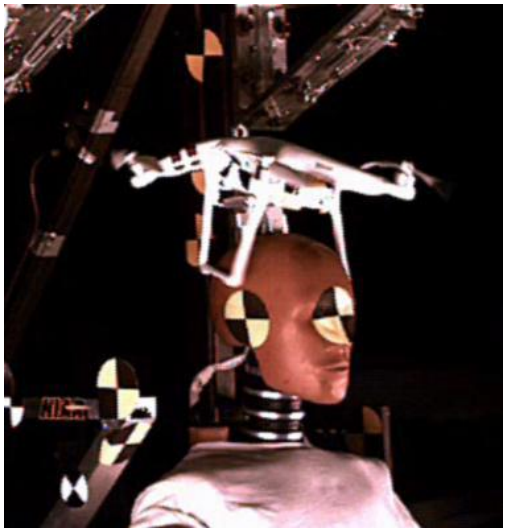
Alliance for System Safety of UAS through Research Excellence

"When I look at the future, I see a need for 41,000 commercial jet airplanes over the course of the next 20 years. And that means we are going to need something like 617,000 more pilots — that's a lot of pilots," said Mike Sinnett, Boeing's vice president for product development, at the Paris Air Show on Monday (July 2017). **"One of the ways that may be solved is by having some type of autonomous behavior."**

# Overview

- Federal Activities
- National Picture
- State Status
- Industry Status
- Research



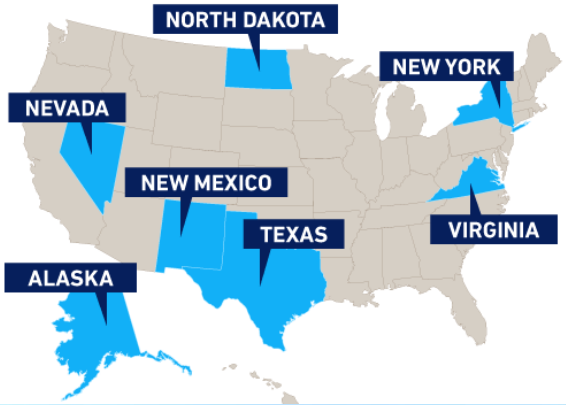
# Federal Activities

- Air Transportation
  - NextGen: System Wide Info Management (SWIM) and Collaborative Decision Making (CDM) progress lead to trajectory based navigation

- Unmanned Aircraft Systems (UAS) / Drone Integration
  - UAS Integration Pilot Program: applications under review
  - 70,000+ Remote Pilot Certificates issued since August 2016
  - FAA Pathfinder Projects: continuing
  - Drone Advisory Committee with 3 Working Groups
  - UAS Identification and Tracking Rulemaking
  - NASA UAS Traffic Management (UTM)
  - DOD: ongoing all over.
  - FEMA establishing regional UAS Working Groups

# National Picture

- FAA Admin “it looks like 2017 will end up being our safest year yet”
- FAA 7 UAS Test Sites:  continuing
- Low Altitude Authorization and Notification Capability (LAANC) implementing at airports
- Kansas / AirMap
- NY NUAIR Corridor
- TX, FL, AL: hurricane response
- MITRE “Digital Copilot Cognitive Assistance” technology




# NC Status

- UAS Integration
  - NCDOT UAS Program Office: permits (2000+), education and outreach workshops, operations
  - NGAT Consortium: 40+ members
  - Exercises:  NCDOT UIX, NCNG VC17
  - Municipality adoption statewide
  - Gray Eagle at Camp Mackall (US Army)
- Industry
  - UAS manufacturing, service providers, integrators

# Industry Status

- Industry is leading the integration
  - U-Avionics cross-over from UAS to manned aircraft with small ADS-B transceiver
  - Boeing, Airbus, eHang, Workhorse, Uber
- Information Service Providers
  - UTM, LAANC, Harris
- Innovations:
  - Systems Integration
  - Data exploitation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# Research Status

- Nationally
  - ASSURE: FAA UAS Center of Excellence
  - PEGASAS: FAA General Aviation COE
  - Electric aircraft
  - “Drone Race: Human Versus Artificial Intelligence”
- Locally
  - University Research Hub under development
  - AirLab Airspace Analysis
  - ASSURE support
- Needed
  - Noise reduction
  - Connectivity
  - Remote cockpit control analysis
  - “Connected Aircraft Demand More And Smarter Sensors…”



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*It is not really necessary to look too far into the future; we see enough already to be certain it will be magnificent. Only let us hurry and open the roads.*

- *Wilbur Wright*